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BHCTP Monthly Discharge Monitoring Report

Month: January-16
Facility: Central Treatment Plant
Location: Bunker Hill Superfund Site
Contract Number: W912DW-13-C-0026-P00008

Total Flow For The Month From 006 Outfall: 54,999,600 gallons
Sludge pumping to CIA sludge pond: 930,000 gallons

Total Flow From Kellogg Tunnel: 52,196,730 gallons

Percent of Influent Successfully Treated: 100.0%

13 sample days * 6 parameters (Pb, Cd, Zn, Mn, TSS & pH) = 78 potential exceedances
78 - 0 exceedances = 78 78/78 = 100%

Results of Sampling Efforts:

All sampling has been performed in accordance with specifications and the Sampling and Analysis Plan. QC and QA samples have been taken as required. All sample analysis results may be found within this DMR.

Performance Evaluation (PE) sampling for the CTP continued, with five PE samples delivered to SVL for this reporting period. The PE samples were identified as CTPXX (random CTP sites). These samples consisted of preserved 500-ml trace metal samples to be analyzed for Cd, Pb and Zn. The PE acceptable quantitation range is listed on the 'QC' page of this DMR.

Trip blank and rinsate samples were also taken, with the results being reported on the 'PTM-004, RB, TB' page of this DMR.

Highlights of Plant Maintenance and/or Plant Optimization:

01-01-16 Performed monthly fire extinguisher inspection. All CTP fire extinguishers are fully charged and in good working condition at this time.

01-01-16 Performed monthly pump and motor inspection. All CTP pumps and motors are in good condition at this time with the exception of the Rapid Mix gear box. Gear box vibration is increasing.

01-04-16 Performed quarterly pump and motor preventative maintenance inspection with Cash Balancing Services. No significant vibration readings were found during this PM inspection. Pump packing adjustment was recommended and was performed by the CTP operators.

01-06-16 Operators performed the lime injection system six-month change over. The #2 lime injection system was placed into service and the #1 lime slurry injection system was flushed and placed into standby mode.

01-07-16 Chief operator discussed the mine yard vault access with Bob Hopper. Mr. Hopper agreed to move the rock piles and vehicles restricting access to the main line AMD line vault. The access must be cleared to perform the six-month AMD line cleaning.

01-13-16 Chief Operator, Process Engineer, Project Manager and COR attended the monthly CTP process review meeting. Process quality, plant operations and operator work schedules were reviewed. Power outage call-outs were discussed. Treated outfall and KT discharge sample analyses were also reviewed. CTP OMER projects were reviewed and discussed. The control building soffit repair has been completed.

01-21-16 Provided an access request letter to Mr. Hopper of the Bunker Hill Mine. The access request letter detailed the time schedule for the AMD main line cleaning event. Mr. Hopper granted verbal approval to the access and KT discharge flow request for Wednesday, January 27th.

01-24-16 06:00 Operators discovered the floc transfer pump was out of service. The power supply breaker had tripped

during the night. The floc alarm did not activate, as the injection pump continued to pump a small amount of flocculent to the alarm probes. Operators tested the floc alarm system and inspected the floc transfer pump components. The floc alarm system activates the alarm as programmed when the floc pump injection pump is removed from service. Operators could not determine the cause of the power breaker disconnect on the floc transfer pump. The transfer pump was manually tested several times after the power supply breaker was reset.

The flocculent injection was out of service for approximately six hours. Approximately 51,000 gallons of KT flow was untreated with flocculent injection, causing elevated process turbidity.

Corrective Action: Operators adjusted the flocculent flow sensors to increase the distance between them.

The increased distance will allow the alarm to activate with the minimal flow produced when the flocculent injection pump remains in service with no flocculent in the injection tank. The injection pump pulses a small amount of residual floc for several hours if it remains operating with no flocculent in the injection tank.

February 6th: The flocculent transfer pump tripped the electrical supply breaker for a second time. The flocculent transfer pump will be replaced with a new unit, as this is a process-critical component.

01-26-16 Operators performed the monthly full load emergency generator run test. The emergency generator operated all CTP components for one hour as programmed with no issues or errors to report.

01-26-16 Six-month AMD main line pigging event was performed with no issues to report.

01-27-16 Quarterly AMD direct feed line pigging event was performed with no issues to report.

01-29-16 Electrician installed an internal heater for the heat trace system. The heater will prevent condensation buildup that occurs, causing the breakers to fail.

During this reporting period:

- The Kellogg Tunnel discharge flow decreased by 11% from January 2015, from 58.4 mg to 52.2 mg.
- The Kellogg Tunnel zinc concentration increased by 9% from January 2015, from an average of 46 mg/L to 50 mg/L.
- The CTP operating pH set point was increased to 8.5 from 8.3 during extended KT low-flow periods.
- The flocculent dosage remained at approximately 2 ppm to reduce process turbidity.
- The CTP sludge recycle rate remained at 400 gpm.
- CTP operators received no off-shift auto dialer call-out alarms.
- CTP operators performed two pumping events from the Lined Pond.
- CTP operators performed Aeration Basin pH probe and grab sample verification twice per day.
- CTP operators observed no Kellogg Tunnel mill operations.

Lessons Learned

No significant lessons to report for last month.

MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
2016	1	1		2016	1	31

PARAMETER		Quantity or Loading			Quality or Concentration				FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS		
pH	Sample Measurement				7.08		7.38		Continuous	Meter
	Permit Required				6.0		10.0			
Flow Thru Treatment Plant	Sample Measurement	1.77	2.30	mgd						
	Permit Required		Daily							
Lead Total - Pb Effluent	Sample Measurement	0.04	0.04	lbs/day		0.003	0.003	mg/L	three samples/ week	Comp 24
	Permit Required	14.8	37.0			0.30	0.60	mg/L		
Zinc Total - Zn Effluent	Sample Measurement	3.73	6.22	lbs/day		0.27	0.44	mg/L	three samples/ week	Comp 24
	Permit Required	36.2	91.3			0.73	1.48	mg/L		
Cadmium - Cd Effluent	Sample Measurement	0.062	0.107	lbs/day		0.004	0.008	mg/L	three samples/ week	Comp 24
	Permit Required	2.40	6.10			0.050	0.100	mg/L		
Manganese - Mn Effluent	Sample Measurement	400.5	595	lbs/day		28.7	39.1	mg/L	three samples/ week	Comp 24
	No Permit Required					N/A	N/A	mg/L		
Total Suspended Solids - TSS	Sample Measurement	26.8	174	lbs/day		1.1	1.6	mg/L	three samples/ week	Comp 24
	Permit Required	985	1907			20	30	mg/L		

PREPARED BY: GARY FULTON

REVIEWED BY: Mark Reinsel, Ph.D., P.E.

**NPDES DISCHARGE POINT 006
CENTRAL TREATMENT PLANT
MONTH: Jan-16**

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	FLOW	TSS		LOADING
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1	0.003	0.04	0.209	3.09	0.004	0.06	21.9	323	7.17	1.77	1.2	17.7	8.0
2										2.05			
3										2.09			
4	0.003	0.04	0.245	4.04	0.004	0.06	32.3	532	7.18	1.98	1.4	23.1	10.5
5										2.11			
6	0.003	0.02	0.315	3.00	0.005	0.05	39.1	372	7.12	1.14	1.6	15.2	6.90
7										0.84			
8	0.003	0.04	0.260	3.88	0.003	0.05	25.7	384	7.19	1.79	0.8	12.0	5.42
9										2.08			
10										2.04			
11	0.003	0.04	0.208	3.36	0.003	0.05	32.0	517	7.21	1.94	1.0	16.2	7.33
12										2.04			
13	0.003	0.04	0.234	3.96	0.004	0.07	35.1	595	7.19	2.03	1.0	16.9	7.68
14										1.10			
15	0.003	0.02	0.249	1.78	0.004	0.03	35.0	250	7.08	0.86	1.2	8.58	3.89
16										1.91			
17										1.51			
18	0.003	0.04	0.199	3.40	0.004	0.06	20.4	348	7.11	2.05	1.0	17.1	7.74
19										2.01			
20	0.003	0.04	0.215	3.73	0.003	0.05	31.2	542	7.08	2.08	0.4	6.94	3.15
21										1.18			
22	0.003	0.03	0.309	3.79	0.004	0.05	32.3	396	7.18	1.47	1.0	12.3	5.56
23										1.85			
24										2.11			
25	0.003	0.04	0.367	6.22	0.006	0.11	24.3	412	7.26	2.03	0.8	13.6	6.15
26										2.16			
27	0.003	0.02	0.442	4.13	0.008	0.07	22.8	213	7.38	1.12	1.6	15.0	6.78
28										1.31			
29	0.003	0.04	0.268	4.10	0.006	0.09	21.0	321	7.31	1.83	1.0	174.5	79.1
30										2.30			
31										2.24			
Total	0.033	0.46	3.52	48.5	0.06	0.80	373.1	5206	93.5	55.00	14	348.9	158.3
Sample Events	13	13	13	13	13	13	13	13	13	31	13	13	13
Daily Average	0.003	0.04	0.27	3.73	0.004	0.06	28.7	400	7.19	1.77	1.08	26.84	12.17
Lab Detection Limit	0.003		0.004		0.001		0.004		0.01		0.800		
MIN	0.0025	0.02	0.20	1.78	0.0031	0.03	20.40	213	7.08	0.84	0.40	6.94	3.15
MAX	0.0026	0.04	0.44	6.22	0.008	0.11	39.10	595	7.38	2.30	1.60	174.46	79.13

**KELLOGG TUNNEL DISCHARGE
CENTRAL TREATMENT PLANT
MONTH: Jan-16
Data from SVL**

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	006 FLOW mgd	TSS		
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day			kg/day		
1										1.77			
2										2.05			
3										2.09			
4	0.460	7.58	38	633	0.054	0.89	74	1,223	4.22	1.98	32	527	239
5										2.11			
6										1.14			
7	0.509	3.57	70	487	0.108	0.76	25	176	2.96	0.84	19	133	60
8										1.79			
9										2.08			
10										2.04			
11	0.424	6.85	34	545	0.049	0.79	76	1,225	4.39	1.94	31	501	227
12										2.04			
13										2.03			
14	0.532	4.88	64	589	0.114	1.05	26	239	3.07	1.10	19	174	79
15										0.86			
16										1.91			
17										1.51			
18	0.438	7.48	37	632	0.050	0.86	75	1,279	4.15	2.05	34	580	263
19										2.01			
20										2.08			
21	0.495	4.86	63	622	0.101	0.99	24	238	3.04	1.18	17	167	76
22										1.47			
23										1.85			
24										2.11			
25	0.421	7.14	33	553	0.048	0.81	74	1,249	4.26	2.03	31	525	238
26										2.16			
27										1.12			
28	0.492	5.38	64	700	0.099	1.08	25	278	3.07	1.31	17	186	84
29										1.83			
30										2.30			
31										2.24			

**PTM Effluent at Lined Storage Pond
CENTRAL TREATMENT PLANT**

Month: Jan-16

DATE	LEAD mg/L	ZINC mg/L	CADMIUM mg/L	pH s.u.	TSS mg/L
01/07/16	0.018	9.7	1.02	7.42	0.8
01/21/16	0.033	10.3	1.11	7.39	0.8

**RINSATE AND TRIP BLANKS
CENTRAL TREATMENT PLANT**

Month: Jan-16

Rinsate and Trip Blank samples will be taken approximately every 20 QC events, or one each per month.

LOCATION	DATE	SAMPLE	LEAD mg/L	ZINC mg/L	CADMIUM mg/L
Rinsate & Trip Blank					
KT Discharge	01-11-16	RB-01-11-16	<0.01	<0.004	<0.002
Trip Blank (D.I.water)		TB-01-11-16	<0.01	<0.004	<0.002

Bunker Hill Central Treatment Plant

Daily log January 2016

		INFLUENT KT		AERATION BASIN				CLARIFIER				DISCHARGE 006				RECYCLE SG		LIME SLURRY			SLUDGE PUMP		POND PUMP		SLUDGE GUN TEST		LINED POND								
DATE	OP	GPM	pH	SET	pH1	grab	pH1	grab	pH2	grab	pH2	grab	TURB	TEMP	pH3	grab	pH3	grab	TURB	FLOW	SG	GPM	SG	%solid	Injection Valve	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	ESTIMATED		
					a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.												Elevation (mg)	
1/1	GC			8.3	8.4	8.4	8.4	8.4	8.1	7.9	8.2	8.0	0.70	37	7.5	7.5	7.7	7.6	0.45	1.77	1.035	400	1.063	9.8	265/25	3	60					2269.5 (1.25 mg)			
1/2	GC			8.3	8.3	8.3	8.4	8.4	8.2	8.0	8.3	8.1	1.07	35	7.6	7.6	7.8	7.7	0.98	2.05	1.035	400	1.064	10.0	288/25	3	60					2269.5			
1/3	SB			8.3	8.3	8.4	8.4	8.4	8.2	8.2	8.2	8.1	1.23	38	7.9	7.3	8.0	7.4	1.05	2.09	1.037	400	1.063	9.8	294/25	3	65					2269.5			
1/4	GF,SB	1375	3.85	8.3	8.3	8.3	8.2	8.2	8.1	8.0	8.2	8.2	1.57	37	7.8	7.3	7.8	7.2	1.05	1.98	1.035	400	1.064	10.0	292/25	3	100					2269.5			
1/5	GF,SB,GC			8.3	8.3	8.4	8.3	8.3	8.0	8.1	8.1	7.9	1.60	49	7.8	7.4	7.9	7.4	1.54	2.11	1.034	400	1.063	9.8	287/25	3	60					2269.5			
1/6	GF,SB,GC			8.5	8.5	8.5	8.5	8.5	8.1	8.3	8.0	8.0	1.70	47	7.8	7.2	7.7	7.3	0.80	1.14	1.025	400	1.061	9.5	234/11	3	0					2269.50			
1/7	GF,GC	550	2.92	8.5	8.5	8.4	8.3	8.3	8.0	8.0	8.1	7.9	1.18	46	7.6	7.5	7.6	7.5	0.90	0.84	1.028	400	1.064	10.0	199/15	3	60					2270.0 (1.5mg)			
1/8	GF,GC			8.3	8.4	8.4	8.3	8.3	8.0	8.0	8.1	8.1	1.10	48	7.5	7.2	7.6	7.3	0.80	1.79	1.039	400	1.059	9.3	185/25	3	80					2270.0			
1/9	GC			8.3	8.3	8.3	8.4	8.4	8.1	8.0	8.2	8.1	1.15	46	7.6	7.7	8.0	7.6	0.70	2.08	1.032	400	1.058	9.1	203/25	3	50					2270.0			
1/10	SB			8.3	8.3	8.3	8.3	8.4	8.1	8.2	8.1	8.1	1.17	47	7.8	7.4	7.9	7.4	0.92	2.04	1.037	400	1.059	9.3	190/25	3	70					2270.0			
1/11	GF,SB	1354	4.13	8.3	8.3	8.3	8.3	8.4	8.0	8.0	8.0	8.1	1.30	47	7.6	7.3	7.9	7.3	1.00	1.94	1.039	400	1.059	9.3	182/25	3	80			10"	8"	2270.0			
1/12	GF,GC			8.3	8.3	8.3	8.2	8.3	8.0	8.0	7.9	8.0	1.65	49	7.9	7.3	7.7	7.3	1.20	2.04	1.037	400	1.058	9.1	188/25	3	100					2270.0			
1/13	GF,SB,GC			8.3	8.4	8.4	8.5	8.5	8.1	8.1	8.0	8.1	1.60	50	7.6	7.3	7.7	8.2	1.20	2.03	1.037	400	1.058	9.1	268/25	3	100					2270.0			
1/14	GF,SB,GC	570	2.95	8.5	8.5	8.5	8.7	8.7	7.9	7.9	7.9	7.9	1.70	48	7.5	7.4	7.4	7.2	1.43	1.10	1.027	400	1.058	9.1	248/11	3	0					2270.5 (1.75 mg)			
1/15	GF,GC			8.5	8.5	8.5	8.3	8.4	8.0	8.0	7.9	8.0	1.10	45	7.6	7.2	7.5	7.2	0.85	0.86	1.025	400	1.057	9.0	294/10	3	30					2270.5			
1/16	GC			8.3	8.4	8.4	8.3	8.3	8.0	8.1	8.1	8.0	0.68	46	7.6	7.7	7.6	7.5	0.50	1.91	1.035	400	1.059	9.3	299/20	3	40					2270.5			
1/17	SB			8.3	8.9	8.9	8.4	8.4	8.2	8.3	8.3	8.3	0.76	46	7.6	7.3	7.9	7.6	0.68	1.51	1.034	400	1.060	9.4	375/20	3	35					2270.5			
1/18	SB	1375	4.20	8.3	8.3	8.3	8.3	8.3	8.1	8.2	8.1	8.2	0.85	46	7.8	7.4	7.9	7.5	0.69	2.05	1.037	400	1.060	9.4	329/20	3	60					2270.5			
1/19	GF,SB,GC			8.3	8.3	8.3	8.3	8.3	8.0	8.0	8.0	8.0	0.62	49	7.7	7.5	7.7	7.5	0.73	2.01	1.038	400	1.061	9.5	276/20	3	70					2270.5			
1/20	GF,SB,GC			8.3	8.3	8.3	8.5	8.4	8.0	8.0	8.0	8.0	1.10	50	7.6	7.5	7.9	7.6	1.07	2.08	1.038	400	1.061	9.5	303/20	3	60					2270.5			
1/21	GF,SB,GC	580	3.00	8.5	8.5	8.5	8.5	8.5	7.9	8.1	8.0	8.1	1.25	47	7.5	7.5	7.5	7.4	0.94	1.18	1.023	400	1.062	9.7	290/10	3	30	#3-07:00	13:00			2271.0 (2.25mg)			
1/22	GF,GC			8.5	8.5	8.4	8.3	8.3	7.8	8.0	7.9	8.0	1.01	47	7.6	7.5	7.6	7.5	0.98	1.47	1.027	400	1.058	9.1	294/10	3	30					2270.0 (1.5mg)			
1/23	GC			8.3	8.3	8.4	8.4	8.4	7.8	8.1	8.0	7.9	3.97	49	7.8	7.5	7.9	7.5	2.00	1.85	1.031	400	1.062	9.7	273/20	3	30					2270.0			
1/24	SB			8.3	8.4	8.3	8.3	8.3	7.9	8.1	8.0	8.1	4.00	49	7.8	7.4	7.9	7.6	3.10	2.11	1.037	400	1.063	9.8	227/20	3	60					2270.0			
1/25	GF,SB	1417	4.10	8.3	8.4	8.3	8.3	8.3	7.9	7.9	8.1	8.0	2.80	48	7.7	7.3	8.0	7.5	2.60	2.03	1.040	400	1.062	9.7	323/20	3	70					2270.0			
1/26	GF,SB,GC			8.3	8.3	8.3	8.5	8.5	7.9	7.9	8.0	8.0	2.58	46	7.8	7.4	7.6	7.4	2.47	2.16	1.037	400	1.064	10.0	318/20	3	60					2270.0			
1/27	GF,SB,GC			8.5	8.6	8.5	8.5	8.4	8.0	8.0	8.1	8.0	1.90	50	7.5	7.3	7.8	7.5	1.81	1.12	1.021	400	1.064	10.0	266/10	3	30	#3-06:00	11:30			2270.0			
1/28	GF,SB,GC	600	2.97	8.5	8.5	8.5	8.4	8.4	8.0	8.0	8.0	8.0	1.36	46	7.8	7.6	7.6	7.5	1.36	1.31	1.034	400	1.062	9.7	268/10	3	60					2270.0			
1/29	GF,GC			8.3	8.4	8.4	8.4	8.4	8.1	8.1	8.0	8.0	0.90	49	7.7	7.6	7.8	7.5	0.80	1.83	1.036	400	1.080	12.3	326/20	3	60					2270.0			
1/30	GC			8.3	8.3	8.3	8.4	8.4	8.1	8.0	8.1	8.1	1.08	48	7.8	7.8	8.0	8.0	0.76	2.30	1.035	400	1.070	10.8	323/20	3	60					2270.0			
1/31	SB			8.3	8.3	8.4	8.3	8.3	8.1	8.1	8.1	8.0	1.14	46	7.9	7.4	8.0	7.5	0.96	2.24	1.036	400	1.068	10.5	310/20	3	60					2270.0			
Averages:				8.35	8.39	8.39	8.37	8.38	8.02	8.05	8.05	8.04	1.48		7.68	7.42	7.77	7.49	1.17	55.0	1.034													56	
Notes:																																			1730
01-05-16 06:30 Recalibrated 006 pH probe.																																			1,038,000 Gallons
01-05-16 13:00 KT flow decreased from 1380 gpm to 580 gpm.																																			
01-06-16 12:45 Placed the #2 lime injection system into service, placed the #1 lime injection system into standby mode. #1 line slurry injection and return lines were flushed and drained.																																			
01-07-16 10:00 KT flow increased from 550 gpm to 1300 gpm.																																			
1-10-16 Placed lime slaker B into service and placed lime slaker A into standby mode.																																			
01-12-16 08:30 Placed the #1 lime injection system into service, placed the #2 lime injection system into standby mode. #2 line slurry injection valve located on the Rapid Mix Tank has failed.																																			
01-13-16 08:30 KT flow decreased from approximately 1400 gpm to 580 gpm.																																			
01-14-16 11:00 Placed #1 lime loop in standby mode. Replaced pinch valve in #2 lime loop and activated system.																																			
01-15-16 09:00 KT flow increased from 550 gpm to 1450 gpm.																																			
01-17-16 06:00 KT flow was 1100 gpm for the past 8 hours. 08:30 KT flow returned to approximately 1400 gpm.																																			
01-20-16 11:45 KT flow decreased from approximately 1400 gpm to 580 gpm.																																			
01-21-16 Diverted KT flow to Lined Pond and activated #3 Lined Pond pump form 07:00 to 13:00.																																			
01-22-16 12:00 KT flow increased from 580 gpm to 1400 gpm.																																			
01-22-16 Floc transfer pump tripped breaker during the night, causing turbidity to increase. Floc alarm did not activate. Approximately six hours with no floc injection.																																			
01-26-16 Performed the Direct Feed Line quarterly pigging event.																																			
01-26-16 KT flow decreased from 1400 gpm to 580 gpm.																																			
01-27-16 06:00 -11:30 Diverted the KT low flow to the Lined Pond for the main line pigging event. Activated the #3 Lined Pond pump.																																			
01-27-16 13:00 Recalibrated Aeration Basin																																			

CENTRAL TREATMENT PLANT

MISCELLANEOUS FLOWS

Month : Jan-16

Date	KT Flow Meter Reading
12/31/2015	0
1/31/2016	52,196,730
Total	52,196,730

Date	006 Flow Meter Reading
12/31/2015	0
1/31/2016	54,999,600
Total	54,999,600

Sweeny Pump Station Reading				
Date	#1 Pump	620 gpm	#2 Pump	500 gpm
12/31/2015	170.0	Hours	785.0	Hours
1/31/2016	170.0	Hours	785.0	Hours
Total Hours	0.0	Hours	0.0	Hours
Total Flow for 004/Sweeny For The Month =		0	Gallons	

PTM Discharge Flow	
Date	Flow (gpm)
01/07/16	7.5
01/18/16	12.0

Date	Lined Storage Pond Water Level			
12/31/2015	1,250,000	gal	Elev. =	2269.5
1/31/2016	1,500,000	gal	Elev. =	2270.0

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2000-2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan.	61,000,000	61,677,510	54,606,100	53,066,890	52,223,080	53,150,000	56,050,900	56,281,000	53,465,820	50,936,960
Feb.	57,600,000	45,584,000	52,840,000	46,493,470	48,306,920	49,860,000	51,188,000	50,511,300	49,282,209	48,146,111
March	60,730,000	57,740,360	50,452,060	60,162,290	59,852,720	58,073,000	56,332,830	65,443,650	54,578,130	61,712,540
April	68,680,000	54,846,000	65,583,230	63,335,350	50,715,310	53,775,350	72,039,280	66,636,500	61,690,530	63,055,350
May	97,719,900	57,501,901	76,082,410	63,335,350	53,245,000	54,181,650	72,027,000	63,203,308	86,680,760	70,233,580
June	69,800,000	55,835,590	67,299,960	59,532,434	50,451,170	51,750,000	68,385,600	57,981,410	82,622,590	64,623,180
July	63,698,850	53,652,330	64,820,120	66,252,746	56,538,980	55,255,000	64,054,000	58,282,900	66,324,500	61,535,000
Aug.	66,707,120	45,289,000	58,212,940	62,074,750	52,002,140	49,970,000	64,621,000	55,335,900	65,168,620	56,446,670
Sept.	55,797,530	50,276,020	60,140,460	43,789,000	49,208,020	49,987,000	54,515,270	50,471,870	61,074,020	57,006,430
Oct.	60,424,720	50,660,840	54,485,871	52,869,290	59,601,690	52,807,000	57,610,030	50,086,330	58,666,300	55,830,000
Nov.	53,408,660	50,660,840	51,072,259	47,600,000	51,948,000	50,722,600	55,191,700	50,779,040	52,041,780	54,956,800
Dec.	56,414,870	53,464,780	56,034,000	56,413,080	56,770,000	54,904,400	60,486,900	53,716,210	55,727,260	54,542,700
Totals	771,981,650	637,189,171	711,629,410	674,924,650	640,863,030	634,436,000	732,502,510	678,729,418	747,322,519	699,025,321

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Jan.	55,503,180	61,797,170	58,434,610	61,855,400	57,478,450	58,440,540	52,196,730			
Feb.	50,819,910	54,556,227	57,763,170	59,383,290	54,607,950	59,767,470				
March	54,691,420	61,373,630	67,236,650	66,264,780	65,396,350	64,468,230				
April	56,255,340	65,687,340	81,233,630	69,619,100	65,618,770	63,056,840				
May	58,825,640	84,365,390	86,826,340	71,496,380	80,598,590	61,898,200				
June	56,770,200	79,985,540	83,440,990	64,663,900	65,623,330	56,368,540				
July	56,727,510	79,346,330	74,315,690	62,844,790	63,425,030	55,655,000				
Aug.	56,239,370	70,377,570	68,986,900	58,459,380	61,486,270	55,316,100				
Sept.	54,109,980	60,404,280	62,270,300	58,097,500	56,279,590	53,890,000				
Oct.	55,480,200	62,403,480	59,991,850	58,325,780	60,659,850	52,082,800				
Nov.	54,856,880	58,430,700	57,184,220	56,215,000	55,065,100	49,812,540				
Dec.	54,607,330	58,617,700	61,750,390	56,932,530	59,770,540	51,521,900				
Totals	664,886,960	797,345,357	819,434,740	744,157,830	746,009,820	682,278,160	52,196,730	0	0	0

 Yellow indicates record monthly flow as well as record annual flow

KELLOGG TUNNEL ZINC DATA

Month	Concentration (mg/L)												
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Jan.		86	81	79	63	70	61	72	57	68	41	46	50
Feb.		86	91	96	55	72	57	95	58	68	41	68	
March		94	116	86	65	68	53	86	58	69	58	81	
April		98	121	140	85	80	50	137	176	86	107	92	
May		105	231	179	318	136	57	377	215	150	177	87	
June		107	182	118	271	143	68	347	164	106	131	78	
July		90	144	111	198	117	75	181	136	87	87	75	
Aug.		87	112	92	132	94	79	130	110	86	76	66	
Sept.		84	107	80	107	76	81	132	107	75	66	63	
Oct.	59	81	100	88	99	75	70	86	70	67	63	54	
Nov.	66	79	88	88	104	63	57	95	71	70	55	44	
Dec.	67	62	78	65	76	59	61	88	69	54	49	55	
average	64	88	121	102	131	88	64	152	108	82	79	67	
lime usage (tons/day)		2.59	3.23	2.76	4.78	3.24	2.16	4.31	3.93	2.46	2.70	1.99	
Zinc Conc. Increase/Decrease			37%	-16%	29%	-33%	-27%	138%	-29%	-24%	-4%	-15%	
Lime Usage Increase/Decrease			25%	-15%	73%	-32%	-33%	100%	-9%	-37%	10%	-26%	

Bunker Hill Superfund Site							
Kellogg, Idaho							
Central Treatment Plant Review							
Month: Jan-16							
SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION	MATRIX SPIKE DATA
LOCATION			RESULTS			% RPD	% RECOVERY
006/CTP Outfall	01/01/16	Cadmium	0.004	0.004	mg/L	-2.6%	100%
		Lead	0.003	0.003	mg/L	0.0%	94%
Lab Duplicate		Manganese	32.3	33.0	mg/L	-2.1%	118%
		Zinc	0.245	0.248	mg/L	-1.2%	93%
		pH	7.18	7.18	s.u.	0.0%	
		TSS	1.4	1.4	mg/L	0.0%	
Kellogg Tunnel	01/04/16	Cadmium	0.053	0.053	mg/L	0.6%	107%
		Lead	0.460	0.459	mg/L	0.2%	100%
Lab Duplicate		Manganese	74.2	73.7	mg/L	0.7%	94%
		Zinc	38.4	36.4	mg/L	5.3%	
		pH	3.02	3.02	s.u.	0.0%	
		TSS	32.0	30.0	mg/L	6.5%	
006/CTP Outfall	01/06/16	Cadmium	0.005	0.005	mg/L	0.0%	101%
		Lead	0.003	0.003	mg/L	0.0%	94%
Lab Duplicate		Manganese	39.1	39.0	mg/L	0.3%	
		Zinc	0.315	0.314	mg/L	0.3%	92%
		pH	7.12	7.08	s.u.	0.6%	
		TSS	1.6	1.6	mg/L	0.0%	
Performance	01/07/16	Cadmium	0.049	0.050	mg/L	-1.4%	
Evaluation		Lead	0.312	0.300	mg/L	3.9%	
Sample		Zinc	0.857	0.730	mg/L	16.0%	
(CTPXX-01-07-16)							
CTPXX-01-07-16	01/07/16	Cadmium	0.049	0.049	mg/L	0.4%	90%
		Lead	0.312	0.314	mg/L	-0.6%	91%
Lab Duplicate		Manganese	0.002	0.002	mg/L	0.0%	92%
		Zinc	0.857	0.856	mg/L	0.1%	92%
PTM Discharge	01/07/16	Cadmium	1.02	1.01	mg/L	1.0%	
		Lead	0.018	0.017	mg/L	5.2%	
QC Sample		Manganese			mg/L		
		Zinc	9.73	9.76	mg/L	-0.3%	
		pH	7.42	7.47	s.u.	-0.7%	
		TSS	0.8	0.2	mg/L	120.0%	
006/CTP Outfall	01/08/16	Cadmium	0.003	0.003	mg/L	-3.0%	96%
		Lead	0.003	0.003	mg/L	0.0%	92%
Lab Duplicate		Manganese	25.7	25.8	mg/L	-0.4%	97%
		Zinc	0.260	0.265	mg/L	-1.9%	95%
		pH	7.19	7.16	s.u.	0.4%	
		TSS	0.8	0.8	mg/L	0.0%	
006/CTP Outfall	01/11/16	Cadmium	0.003	0.003	mg/L	-3.2%	101%
		Lead	0.003	0.003	mg/L	0.0%	93%
Lab Duplicate		Manganese	32.0	32.3	mg/L	-0.9%	
		Zinc	0.208	0.213	mg/L	-2.4%	94%
		pH	7.19	7.16	s.u.	0.4%	
		TSS	1.0	0.8	mg/L	22.2%	
Kellogg Tunnel	01/11/16	Cadmium	0.049	0.050	mg/L	-1.6%	

SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION	MATRIX SPIKE DATA
LOCATION			RESULTS			% RPD	% RECOVERY
QC Sample		Lead	0.424	0.430	mg/L	-1.4%	
		Manganese	75.8	75.4	mg/L	0.5%	
		Zinc	33.7	34.2	mg/L	-1.5%	
		pH	4.39	4.33	s.u.	1.4%	
		TSS	31.0	27.0	mg/L	13.8%	
RB-01-11-16	01/11/16	Cadmium	0.009	0.009	mg/L	0.0%	98%
Lab Duplicate		Lead	0.003	0.003	mg/L	0.0%	98%
		Manganese	0.002	0.002	mg/L	0.0%	98%
		Zinc	0.004	0.004	mg/L	0.0%	98%
006/CTP Outfall	01/13/16	Cadmium	0.004	0.004	mg/L	-7.2%	101%
Lab Duplicate		Lead	0.003	0.003	mg/L	0.0%	95%
		Manganese	35.1	35.1	mg/L	0.0%	116%
		Zinc	0.234	0.234	mg/L	0.0%	95%
		pH	7.19	7.12	s.u.	1.0%	
		TSS	1.0	1.0	mg/L	0.0%	
Performance	01/14/16	Cadmium	0.055	0.050	mg/L	9.2%	
Evaluation		Lead	0.341	0.300	mg/L	12.8%	
Sample		Zinc	0.927	0.730	mg/L	23.8%	
<i>(CTPXX-01-14-16)</i>							
CTPXX-01-14-16	01/14/16	Cadmium	0.055	0.055	mg/L	0.4%	102%
Lab Duplicate		Lead	0.344	0.341	mg/L	0.9%	101%
		Manganese	0.002	0.002	mg/L	0.0%	100%
		Zinc	0.927	0.923	mg/L	0.4%	99%
006/CTP Outfall	01/15/16	Cadmium	0.004	0.004	mg/L	2.5%	107%
Lab Duplicate		Lead	0.003	0.003	mg/L	0.0%	100%
		Manganese	35.0	35.1	mg/L	-0.3%	
		Zinc	0.249	0.250	mg/L	-0.4%	100%
		pH	7.08	7.03	s.u.	0.7%	
		TSS	1.2	2.0	mg/L	-50.0%	
006/CTP Outfall	01/18/16	Cadmium	0.004	0.003	mg/L	2.9%	104%
Lab Duplicate		Lead	0.003	0.003	mg/L	0.0%	98%
		Manganese	20.4	20.4	mg/L	0.0%	
		Zinc	0.199	0.200	mg/L	-0.5%	98%
		pH	7.11	7.04	s.u.	1.0%	
		TSS	1.0	1.0	mg/L	0.0%	
Kellogg Tunnel	01/18/16	Cadmium	0.050	0.051	mg/L	-2.0%	105%
Lab Duplicate		Lead	0.438	0.450	mg/L	-2.7%	99%
		Manganese	74.9	75.6	mg/L	-0.9%	
		Zinc	37.0	37.4	mg/L	-1.1%	87%
		pH			s.u.		
		TSS			mg/L		
006/CTP Outfall	01/20/16	Cadmium	0.003	0.003	mg/L	6.7%	102%
Lab Duplicate		Lead	0.003	0.003	mg/L	0.0%	95%
		Manganese	31.2	31.0	mg/L	0.6%	
		Zinc	0.215	0.216	mg/L	-0.5%	96%
		pH	7.08	6.99	s.u.	1.3%	
		TSS	0.4	0.4	mg/L	0.0%	
Performance	01/21/16	Cadmium	0.051	0.050	mg/L	1.6%	
Evaluation		Lead	0.321	0.300	mg/L	6.8%	
Sample		Zinc	0.866	0.730	mg/L	17.0%	

SAMPLE	DATE	PARAMETER	VALUE	QC/dup	UNITS	PRECISION	MATRIX SPIKE DATA
LOCATION			RESULTS			% RPD	% RECOVERY
<i>(CTPXX-01-21-16)</i>							
CTPXX-01-21-16	01/21/16	Cadmium	0.051	0.052	mg/L	-1.6%	96%
		Lead	0.321	0.326	mg/L	-1.5%	96%
Lab Duplicate		Manganese	0.002	0.002	mg/L	0.0%	97%
		Zinc	0.866	0.880	mg/L	-1.6%	97%
006/CTP Outfall	01/22/16	Cadmium	0.004	0.005	mg/L	-11.2%	
		Lead	0.003	0.003	mg/L	0.0%	
QC Sample		Manganese	32.3	32.8	mg/L	-1.5%	
		Zinc	0.309	0.321	mg/L	-3.8%	
		pH	7.18	7.17	s.u.	0.1%	
		TSS	1.0	1.2	mg/L	-18.2%	
006/CTP Outfall	01/22/16	Cadmium	0.004	0.004	mg/L	-2.4%	102%
		Lead	0.003	0.003	mg/L	0.0%	95%
Lab Duplicate		Manganese	32.3	32.7	mg/L	-1.2%	117%
		Zinc	0.309	0.325	mg/L	-5.0%	98%
		pH	7.18	7.21	s.u.	-0.4%	
		TSS	1.0	1.0	mg/L	0.0%	
Kellogg Tunnel	01/25/16	Cadmium	0.048	0.048	mg/L	0.0%	103%
		Lead	0.421	0.421	mg/L	0.0%	97%
Lab Duplicate		Manganese	73.7	74.1	mg/L	-0.5%	
		Zinc	32.6	32.8	mg/L	-0.6%	
		pH			s.u.		
		TSS			mg/L		
006/CTP Outfall	01/25/16	Cadmium	0.006	0.007	mg/L	-4.7%	101%
		Lead	0.003	0.003	mg/L	0.0%	95%
Lab Duplicate		Manganese	24.3	24.6	mg/L	-1.2%	
		Zinc	0.367	0.388	mg/L	-5.6%	99%
		pH	7.26	7.22	s.u.	0.6%	
		TSS	0.8	0.8	mg/L	0.0%	
006/CTP Outfall	01/27/16	Cadmium	0.008	0.009	mg/L	-6.1%	97%
		Lead	0.003	0.003	mg/L	0.0%	92%
Lab Duplicate		Manganese	22.8	22.7	mg/L	0.4%	
		Zinc	0.442	0.465	mg/L	-5.1%	96%
		pH	7.38	7.37	s.u.	0.1%	
		TSS	1.6	1.6	mg/L	0.0%	
Performance	01/28/16	Cadmium	0.054	0.050	mg/L	6.9%	
Evaluation		Lead	0.337	0.300	mg/L	11.6%	
Sample		Zinc	0.901	0.730	mg/L	21.0%	
<i>(CTPXX-01-28-16)</i>							
CTPXX-01-28-16	01/28/16	Cadmium	0.054	0.053	mg/L	0.6%	96%
		Lead	0.337	0.339	mg/L	-0.6%	95%
Lab Duplicate		Manganese	0.002	0.002	mg/L	0.0%	97%
		Zinc	0.901	0.897	mg/L	0.4%	96%
006/CTP Outfall	01/29/16	Cadmium	0.006	0.006	mg/L	-3.3%	101%
		Lead	0.003	0.003	mg/L	0.0%	94%
Lab Duplicate		Manganese	21.0	21.2	mg/L	-0.9%	86%
		Zinc	0.268	0.282	mg/L	-5.1%	97%
		pH	7.31	7.33	s.u.	-0.3%	
		TSS	1.0	1.0	mg/L	0.0%	
<i>January 2016, Completeness</i>		Cadmium	27	Valid	Total	27	

Bunker Hill Superfund Site
Kellogg, Idaho
Central Treatment Plant Review
Month: Jan-16

SAMPLE	DATE	PARAMETER	CONCENTRATION (mg/L)			PRECISION	COMMENTS
			SPIKE ADDED	DUPLICATE RESULT	SPIKE RESULT		
006/CTP Outfall	01/01/16	Cadmium	1.00	0.985	0.998	1.4%	
MS/MSD		Lead	1.00	0.935	0.938	0.3%	
		Manganese	1.00	32.7	33.5	2.5%	Sample conc. >> spike level
		Zinc	1.00	1.17	1.18	0.9%	
Kellogg Tunnel	01/04/16	Cadmium	1.00	1.13	1.13	0.2%	
MS/MSD		Lead	1.00	1.47	1.46	0.6%	
		Manganese	1.00	74.7	75.1	0.6%	Sample conc. >> spike level
		Zinc	1.00	39.8	36.7	8.3%	
006/CTP Outfall	01/06/16	Cadmium	1.00	1.02	1.01	0.6%	
MS/MSD		Lead	1.00	0.953	0.943	1.1%	
		Manganese	1.00	39.8	39.8	0.0%	Sample conc. >> spike level
		Zinc	1.00	1.23	1.24	0.5%	
PE Sample	01/07/16	Cadmium	1.00	0.949	0.952	0.2%	
MS/MSD		Lead	1.00	1.22	1.22	0.4%	
CTPXX-01-07-16		Manganese	1.00	0.914	0.919	0.5%	Sample conc. >> spike level
		Zinc	1.00	1.78	1.78	0.2%	
006/CTP Outfall	01/08/16	Cadmium	1.00	0.959	0.961	0.3%	
MS/MSD		Lead	1.00	0.913	0.916	0.3%	
		Manganese	1.00	27.2	26.7	2.0%	Sample conc. >> spike level
		Zinc	1.00	1.20	1.21	0.6%	
006/CTP Outfall	01/11/16	Cadmium	1.00	1.01	1.01	0.1%	
MS/MSD		Lead	1.00	0.927	0.929	0.2%	
		Manganese	1.00	33.0	33.3	0.7%	Sample conc. >> spike level
		Zinc	1.00	1.15	1.15	0.2%	
RB-01-11-16	01/11/16	Cadmium	1.00	0.980	0.976	0.4%	
MS/MSD		Lead	1.00	0.982	0.977	0.4%	
		Manganese	1.00	0.976	0.980	0.4%	Sample conc. >> spike level
		Zinc	1.00	0.984	0.978	0.6%	
006/CTP Outfall	01/13/16	Cadmium	1.00	1.02	1.02	0.1%	
MS/MSD		Lead	1.00	0.950	0.946	0.4%	
		Manganese	1.00	35.9	36.3	1.0%	Sample conc. >> spike level
		Zinc	1.00	1.19	1.19	0.5%	
PE Sample	01/14/16	Cadmium	1.00	1.09	1.07	1.3%	
MS/MSD		Lead	1.00	1.36	1.35	0.9%	
CTPXX-01-14-15		Manganese	1.00	1.02	0.998	1.9%	Sample conc. >> spike level
		Zinc	1.00	1.95	1.92	1.9%	
006/CTP Outfall	01/15/16	Cadmium	1.00	1.06	1.07	0.6%	
MS/MSD		Lead	1.00	0.998	0.995	0.3%	
		Manganese	1.00	36.0	36.7	1.8%	Sample conc. >> spike level
		Zinc	1.00	1.25	1.25	0.3%	
006/CTP Outfall	01/18/16	Cadmium	1.00	1.03	1.04	1.1%	
MS/MSD		Lead	1.00	0.963	0.976	1.3%	
		Manganese	1.00	21.3	21.7	2.1%	Sample conc. >> spike level

		Zinc	1.00	1.17	1.18	1.2%	
Kellogg Tunnel	01/18/16	Cadmium	1.00	1.11	1.10	0.4%	
MS/MSD		Lead	1.00	1.43	1.42	0.3%	
		Manganese	1.00	75.8	76.5	1.0%	Sample conc. >> spike level
		Zinc	1.00	37.5	37.8	0.9%	
006/CTP Outfall	01/20/16	Cadmium	1.00	1.02	1.02	0.1%	
MS/MSD		Lead	1.00	0.945	0.947	0.2%	
		Manganese	1.00	31.9	31.6	1.2%	Sample conc. >> spike level
		Zinc	1.00	1.17	1.18	0.1%	
PE Sample	01/21/16	Cadmium	1.00	1.02	1.01	0.7%	
MS/MSD		Lead	1.00	1.28	1.28	0.3%	
CTPXX-01-21-16		Manganese	1.00	0.985	0.970	1.5%	Sample conc. >> spike level
		Zinc	1.00	1.85	1.84	0.5%	
006/CTP Outfall	01/22/16	Cadmium	1.00	1.02	1.03	0.7%	
MS/MSD		Lead	1.00	0.943	0.952	1.0%	
		Manganese	1.00	33.6	33.5	0.3%	Sample conc. >> spike level
		Zinc	1.00	1.27	1.29	1.8%	
Kellogg Tunnel	01/25/16	Cadmium	1.00	1.08	1.08	0.1%	
MS/MSD		Lead	1.00	1.39	1.39	0.3%	
		Manganese	1.00	75.7	76.4	0.9%	Sample conc. >> spike level
		Zinc	1.00	34.7	34.6	0.3%	
006/CTP Outfall	01/25/16	Cadmium	1.00	1.02	1.02	0.5%	
MS/MSD		Lead	1.00	0.958	0.949	0.9%	
		Manganese	1.00	25.9	25.6	1.1%	Sample conc. >> spike level
		Zinc	1.00	1.37	1.36	0.8%	
006/CTP Outfall	01/27/16	Cadmium	1.00	0.979	0.982	0.3%	
MS/MSD		Lead	1.00	0.917	0.923	0.7%	
		Manganese	1.00	23.6	23.5	0.5%	Sample conc. >> spike level
		Zinc	1.00	1.39	1.40	0.7%	
PE Sample	01/28/16	Cadmium	1.00	1.01	1.01	0.1%	
MS/MSD		Lead	1.00	1.28	1.29	0.2%	
CTPXX-01-28-16		Manganese	1.00	0.969	0.972	0.3%	Sample conc. >> spike level
		Zinc	1.00	1.86	1.86	0.0%	
006/CTP Outfall	01/29/16	Cadmium	1.00	1.03	1.02	1.0%	
MS/MSD		Lead	1.00	0.953	0.944	1.0%	
		Manganese	1.00	22.0	21.8	0.8%	Sample conc. >> spike level
		Zinc	1.00	1.25	1.24	1.1%	

CTP Mine Water Line Open Channel Inspection Form

**Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.**

Date: January 07, 2016 Inspected By: Gary Fulton, Gary Coast

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Inlet Connection @ KT	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Outlet/Pipeline Inlet	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Bottom (during low flows)	Good / Poor	<u>Ok</u>
Bottom Joints (during low flows)	Good / Poor	<u>Ok</u>
Trash Rack Assembly Rail Units	Good / Poor	<u>Check for corrosion and bolt tightness</u> <u>Ok</u>
Trash Racks	Good / Poor	<u>Removed debris from trash racks</u>
Parshall Flume	Good / Poor	<u>Check fiberglass and joint connections</u> <u>Ok</u>

General Comments:

Bunker mine has no pumps operating at this time.

The Kellogg Tunnel flow at this time is 0.79 mgd (550 gpm), pH at this time is 2.92

All flume components are in good shape at this time with the exception of the flume staff gauge.

Alternate hand held staff gauges will be utilized to verify fume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct.

Operators observed no mill discharge in the flume/trash rack area at this time.

CTP Mine Water Line Open Channel Inspection Form

**Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.**

Date: January 14, 2016 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Inlet Connection @ KT	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Outlet/Pipeline Inlet	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Bottom (during low flows)	Good / Poor	<u>Ok</u>
Bottom Joints (during low flows)	Good / Poor	<u>Ok</u>
Trash Rack Assembly Rail Units	Good / Poor	<u>Check for corrosion and bolt tightness</u> <u>Ok</u>
Trash Racks	Good / Poor	<u>Removed debris from trash racks</u>
Parshall Flume	Good / Poor	<u>Check fiberglass and joint connections</u> <u>Ok</u>

General Comments:

Bunker mine has no pumps operating at this time.

The Kellogg Tunnel flow at this time is 0.82 mgd (570 gpm), pH at this time is 2.95

All flume components are in good shape at this time with the exception of the flume staff gauge.

Alternate hand held staff gauges will be utilized to verify fume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct.

Operators observed no mill discharge in the flume/trash rack area at this time.

CTP Mine Water Line Open Channel Inspection Form

**Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.**

Date: January 21, 2016 Inspected By: Steve Brunner, Gary Coast

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Inlet Connection @ KT	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Outlet/Pipeline Inlet	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Bottom (during low flows)	Good / Poor	<u>Ok</u>
Bottom Joints (during low flows)	Good / Poor	<u>Ok</u>
Trash Rack Assembly Rail Units	Good / Poor	<u>Check for corrosion and bolt tightness</u> <u>Ok</u>
Trash Racks	Good / Poor	<u>Removed debris from trash racks</u>
Parshall Flume	Good / Poor	<u>Check fiberglass and joint connections</u> <u>Ok</u>

General Comments: Removed debris from both trash racks.

Bunker mine has no pump running at this time.

The Kellogg Tunnel flow at this time is 0.85 mgd (580 gpm), pH at this time is 3.00

All flume components are in good shape at this time with the exception of the flume staff gauge.

Alternate hand held staff gauges will be utilized to verify fume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct.

Operators observed no mill discharge in the flume/trash rack area at this time.

CTP Mine Water Line Open Channel Inspection Form

**Note: This form should be utilized weekly during the regular channel cleanout.
Results will be include with the Daily Quality Control Report and monthly DMR.**

Date: January 28, 2016 Inspected By: Steve Brunner, Gary Coast

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Inlet Connection @ KT	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Outlet/Pipeline Inlet	Good / Poor	<u>Check for cracks</u> <u>Ok</u>
Channel Bottom (during low flows)	Good / Poor	<u>Ok</u>
Bottom Joints (during low flows)	Good / Poor	<u>Ok</u>
Trash Rack Assembly Rail Units	Good / Poor	<u>Check for corrosion and bolt tightness</u> <u>Ok</u>
Trash Racks	Good / Poor	<u>Removed debris from trash racks</u>
Parshall Flume	Good / Poor	<u>Check fiberglass and joint connections</u> <u>Ok</u>

General Comments:

Bunker mine has no pump running at this time.

The Kellogg Tunnel flow at this time is 0.86 mgd (600 gpm), pH at this time is 2.97

All flume components are in good shape at this time with the exception of the flume staff gauge.

Alternate hand held staff gauges will be utilized to verify fume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct.

Operators observed no mill discharge in the flume/trash rack area at this time.



Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 01-Jan-16 to 31-Dec-15 Received: 04-Jan-16 Reported: 05-Jan-16 11:31
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LAB #	WSA0001-01	WSA0001-02	WSA0001-03	WSA0001-04	WSA0001-05	-
SAMPLE ID	KT-12-31-15	PTM-12-31-15	CTPK-12-31-15	006-01-01-16	006-01-04-16	-
Reporting Limit	12/31/2015 07:30	12/31/2015 08:00	12/31/2015 07:00	01/01/2016 06:00	01/04/2016 06:00	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.109	1.02	0.0529	0.0038 [3]	0.0038 [3]
Lead	0.0500 mg/L	0.573	0.0172 [3]	0.519	0.0026 [3]	<0.0025 [5]
Manganese	0.0200 mg/L	24.5	-	-	21.9	32.3 [4]
Zinc	0.020 mg/L	64.1 [1]	9.17	0.862	0.209	0.245
Classical Chemistry Parameters (Water)						
pH	pH Units	9.02 [2]	7.62 [2]	-	7.17 [2]	7.18 [2]
Total Susp. Solids	5.0 mg/L	20.0	0.4 [3]	-	1.2	1.4

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Ferguson Contracting	Project: BHCTP	Sampled: 04-Jan-16
901 N. Division		Received: 04-Jan-16
Pinehurst, ID 83850		Reported: 07-Jan-16 11:20

LAB #	WSA0002-01	-	-	-	-	-
SAMPLE ID	KT-01-04-16	-	-	-	-	-
Reporting Limit	01/04/2016 07:30	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0538	-	-	-	-
Lead	0.0500 mg/L	0.460	-	-	-	-
Manganese	0.0200 mg/L	74.2 [3]	-	-	-	-
Zinc	0.020 mg/L	38.4 [1][3]	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	4.22 [2]	-	-	-	-
Total Susp. Solids	5.0 mg/L	32.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 06-Jan-16
901 N. Division		Received: 06-Jan-16
Pinehurst, ID 83850		Reported: 07-Jan-16 12:18

LAB #	WSA0022-01	-	-	-	-	-
SAMPLE ID	006-01-05-16	-	-	-	-	-
Reporting Limit	01/06/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0049 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [4]	-	-	-	-
Manganese	0.0200 mg/L	39.1 [3]	-	-	-	-
Zinc	0.020 mg/L	0.315	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.12 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.6	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 07-Jan-16
901 N. Division		Received: 08-Jan-16
Pinehurst, ID 83850		Reported: 11-Jan-16 15:07

LAB #	WSA0081-01	WSA0081-02	WSA0081-03	WSA0081-04	-	-
SAMPLE ID	KT-01-07-16	PTM-01-07-16	QC-01-07-16	CTF906-01-07-16	-	-
Reporting Limit	01/07/2016 07:30	01/07/2016 08:00	01/07/2016 08:00	01/07/2016 07:00	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.108	1.02	1.01	0.0485	-
Lead	0.0500 mg/L	0.509	0.0178 [3]	0.0189 [3]	0.312	-
Manganese	0.0200 mg/L	25.1	-	-	-	-
Zinc	0.020 mg/L	69.5 [3]	9.73	9.76	0.857	-
Classical Chemistry Parameters (Water)						
pH	pH Units	2.96 [2]	7.42 [2]	7.47 [2]	-	-
Total Susp. Solids	5.0 mg/L	19.0	0.8 [3]	0.2 [3]	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 08-Jan-16
901 N. Division		Received: 08-Jan-16
Pinehurst, ID 83850		Reported: 11-Jan-16 15:06

LAB #	WSA0080-01	-	-	-	-	-
SAMPLE ID	006-01-08-16	-	-	-	-	-
Reporting Limit	01/08/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0033 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [4]	-	-	-	-
Manganese	0.0200 mg/L	25.7 [3]	-	-	-	-
Zinc	0.020 mg/L	0.280	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.19 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.6 [2]	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 11-Jan-16
901 N. Division		Received: 11-Jan-16
Pinehurst, ID 83850		Reported: 12-Jan-16 14:53

LAB #	WSA0101-01	-	-	-	-	-
SAMPLE ID	006-01-11-16	-	-	-	-	-
Reporting Limit	01/11/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0031 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [5]	-	-	-	-
Manganese	0.0200 mg/L	32.0 [3]	-	-	-	-
Zinc	0.020 mg/L	0.208	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.21 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.0 [4]	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 11-Jan-16
901 N. Division		Received: 11-Jan-16
Pinehurst, ID 83850		Reported: 12-Jan-16 14:54

LAB #		WSA0102-01	WSA0102-02	WSA0102-03	WSA0102-04	-	-
SAMPLE ID		KT-01-11-16	QC-01-11-16	TB-01-11-16	RB-01-11-16	-	-
	Reporting Limit	01/11/2016 07:30	01/11/2016 07:30	01/11/2016 07:30	01/11/2016 07:30	-	-
Metals (Total) (Water)							
Lead	0.0500 mg/L	0.424	0.430	<0.0025 [4]	<0.0025 [4]	-	-
Manganese	0.0200 mg/L	75.8	75.4	-	-	-	-
Zinc	0.020 mg/L	33.7	34.2	<0.004 [4]	<0.004 [4]	-	-
Classical Chemistry Parameters (Water)							
pH	pH Units	4.39 [1]	4.33 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	31.0	27.0	-	-	-	-
Metals (Total) (Water)							
Cadmium	0.0100 mg/L	0.0488	0.0486	<0.0009 [4]	<0.0009 [4]	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 13-Jan-16
901 N. Division		Received: 13-Jan-16
Pinehurst, ID 83850		Reported: 14-Jan-16 13:33

LAB #	WSA0139-01	-	-	-	-	-
SAMPLE ID	006-01-13-16	-	-	-	-	-
Reporting Limit	01/13/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0040 [2]	-	-	-	-
Lead	0.0100 mg/L	<0.0025 [4]	-	-	-	-
Manganese	0.0200 mg/L	35.1 [3]	-	-	-	-
Zinc	0.020 mg/L	0.234	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.19 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	3.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 14-Jan-16
901 N. Division		Received: 15-Jan-16
Pinehurst, ID 83850		Reported: 18-Jan-16 13:30

LAB #	WSA0182-01	WSA0182-02	-	-	-	-
SAMPLE ID	KT-01-14-16	CTP105-01-14-16	-	-	-	-
Reporting Limit	01/14/2016 07:30	01/14/2016 07:00	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.114	0.0550	-	-	-
Lead	0.0500 mg/L	0.532	0.344	-	-	-
Manganese	0.0200 mg/L	26.0	-	-	-	-
Zinc	0.020 mg/L	64.2 [1]	0.927	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	3.07 [2]	-	-	-	-
Total Susp. Solids	5.0 mg/L	19.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 15-Jan-16
901 N. Division		Received: 15-Jan-16
Pinehurst, ID 83850		Reported: 18-Jan-16 13:29

LAB #	WSA0181-01	-	-	-	-	-
SAMPLE ID	006-01-15-16	-	-	-	-	-
Reporting Limit	01/15/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0040 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [5]	-	-	-	-
Manganese	0.0200 mg/L	35.0 [3]	-	-	-	-
Zinc	0.020 mg/L	0.249	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.08 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.2 [4]	-	-	-	-

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Ferguson Contracting 901 N. Division Pinehurst, ID 83850	Project: BHCTP	Sampled: 18-Jan-16 Received: 18-Jan-16 Reported: 19-Jan-16 14:43
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LAB #	WSA0198-01	-	-	-	-	-
SAMPLE ID	006-01-18-16	-	-	-	-	-
Reporting Limit	01/18/2016 06:00	-	-	-	-	-

Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0085 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [4]	-	-	-	-
Manganese	0.0200 mg/L	20.4 [3]	-	-	-	-
Zinc	0.020 mg/L	0.199	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.11 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 18-Jan-16
901 N. Division		Received: 18-Jan-16
Pinehurst, ID 83850		Reported: 20-Jan-16 15:49

LAB #	WSA0199-01	-	-	-	-	-
SAMPLE ID	KT-01-18-16	-	-	-	-	-
Reporting Limit	01/18/2016 07:30	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0501	-	-	-	-
Lead	0.0500 mg/L	0.438	-	-	-	-
Manganese	0.0200 mg/L	74.9 [3]	-	-	-	-
Zinc	0.020 mg/L	37.0 [1][3]	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	4.15 [2]	-	-	-	-
Total Susp. Solids	5.0 mg/L	34.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 20-Jan-16
901 N. Division		Received: 20-Jan-16
Pinehurst, ID 83850		Reported: 21-Jan-16 12:55

LAB #	WSA0228-01	-	-	-	-	-
SAMPLE ID	006-01-20-16	-	-	-	-	-
Reporting Limit	01/20/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0031 [2]	-	-	-	-
Lead	0.0100 mg/L	<0.0025 [4]	-	-	-	-
Manganese	0.0200 mg/L	31.2 [3]	-	-	-	-
Zinc	0.020 mg/L	0.215	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.08 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.4 [2]	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 21-Jan-16
901 N. Division		Received: 22-Jan-16
Pinehurst, ID 83850		Reported: 26-Jan-16 14:08

LAB #	WSA0271-01	WSA0271-02	WSA0271-03	-	-	-
SAMPLE ID	KT-01-21-16	PTM-01-21-16	CTPXK-01-21-16	-	-	-
Reporting Limit	01/21/2016 07:30	01/21/2016 08:00	01/21/2016 07:00	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.101	1.11	0.0508	-	-
Lead	0.0500 mg/L	0.485	0.0338 [3]	0.321	-	-
Manganese	0.0200 mg/L	24.3	-	-	-	-
Zinc	0.020 mg/L	63.4 [1]	10.3	0.666	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	3.04 [2]	7.39 [2]	-	-	-
Total Susp. Solids	5.0 mg/L	17.0	0.8 [3]	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 22-Jan-16
901 N. Division		Received: 22-Jan-16
Pinehurst, ID 83850		Reported: 25-Jan-16 13:56

LAB #	WSA0270-01	WSA0270-02	-	-	-	-
SAMPLE ID	006-01-22-16	QC-01-22-16	-	-	-	-
Reporting Limit	01/22/2016 06:00	01/22/2016 06:00	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0042 [2]	0.0047 [2]	-	-	-
Lead	0.0100 mg/L	<0.0025 [4]	<0.0025 [4]	-	-	-
Manganese	0.0200 mg/L	32.3	32.8 [3]	-	-	-
Zinc	0.020 mg/L	0.309	0.321	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.18 [1]	7.17 [1]	-	-	-
Total Susp. Solids	5.0 mg/L	1.0	1.2	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 25-Jan-16
901 N. Division		Received: 25-Jan-16
Pinehurst, ID 83850		Reported: 26-Jan-16 14:05

LAB #	WSA00311-01	-	-	-	-	-
SAMPLE ID	006-01-25-16	-	-	-	-	-
Reporting Limit	01/25/2016 06:00	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0063 [3]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [5]	-	-	-	-
Manganese	0.0200 mg/L	24.3 [1][4]	-	-	-	-
Zinc	0.020 mg/L	0.367	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.26 [2]	-	-	-	-
Total Susp. Solids	5.0 mg/L	0.6 [3]	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 25-Jan-16
901 N. Division		Received: 25-Jan-16
Pinehurst, ID 83850		Reported: 26-Jan-16 14:07

LAB #	WSA0032-01	-	-	-	-	-
SAMPLE ID	KT-01-25-16	-	-	-	-	-
Reporting Limit	01/25/2016 07:30	-	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0476	-	-	-	-
Lead	0.0500 mg/L	0.421	-	-	-	-
Manganese	0.0200 mg/L	73.7 [3]	-	-	-	-
Zinc	0.020 mg/L	32.6 [3]	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	4.26 [3]	-	-	-	-
Total Susp. Solids	5.0 mg/L	31.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 27-Jan-16
901 N. Division		Received: 27-Jan-16
Pinehurst, ID 83850		Reported: 28-Jan-16 12:18

LAB #	WSAQ337-01	-	-	-	-	-
SAMPLE ID	006-01-27-16	-	-	-	-	-
Reporting Limit	01/27/2016 06:00	-	-	-	-	-
Metals [Total] (Water)						
Cadmium	0.0100 mg/L	0.0080 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [4]	-	-	-	-
Manganese	0.0200 mg/L	22.8 [3]	-	-	-	-
Zinc	0.020 mg/L	0.442	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.38 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.6	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 28-Jan-16
901 N. Division		Received: 29-Jan-16
Pinehurst, ID 83850		Reported: 02-Feb-16 09:26

LAB #	WSAC095-01	WSAC095-02	-	-	-	-
SAMPLE ID	KT-01-28-16	CTP04-01-28-16	-	-	-	-
Reporting Limit	01/28/2016 07:30	01/28/2016 07:00	-	-	-	-
Metals (Total) (Water)						
Cadmium	0.0100 mg/L	0.0685	0.0536	-	-	-
Lead	0.0500 mg/L	0.492	0.357	-	-	-
Manganese	0.0200 mg/L	25.4	-	-	-	-
Zinc	0.020 mg/L	64.0 [1]	0.901	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	3.07 [2]	-	-	-	-
Total Susp. Solids	5.0 mg/L	17.0	-	-	-	-

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Ferguson Contracting	Project: BHCTP	Sampled: 29-Jan-16
901 N. Division		Received: 29-Jan-16
Pinehurst, ID 83850		Reported: 01-Feb-16 14:54

LAB #	WSA0294-01	-	-	-	-	-
SAMPLE ID	006-01-29-16	-	-	-	-	-
Reporting Limit	01/29/2016 06:00	-	-	-	-	-
Metals [Total] (Water)						
Cadmium	0.0100 mg/L	0.0060 [2]	-	-	-	-
Lead	0.0500 mg/L	<0.0025 [3]	-	-	-	-
Manganese	0.0200 mg/L	21.0	-	-	-	-
Zinc	0.020 mg/L	0.268	-	-	-	-
Classical Chemistry Parameters (Water)						
pH	pH Units	7.31 [1]	-	-	-	-
Total Susp. Solids	5.0 mg/L	1.0	-	-	-	-

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